

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 257 872
A2

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 87306956.1

(61) Int. Cl. 4: B05C 21/00, B05D 1/32

(22) Date of filing: 06.08.87

(30) Priority: 06.08.86 JP 120518/86

(43) Date of publication of application:
02.03.88 Bulletin 88/09

(64) Designated Contracting States:
DE FR GB IT SE

(71) Applicant: NAGOYA OILCHEMICAL CO., LTD.
213-5 Honowari Minamishibata-cho
Tokai Aichi(JP)

(72) Inventor: Horikid, Seinosuke
NAGOYA OILCHEMICAL COMPANY LIMITED
213-5 Honowari
Minamishibata-cho Tokai Aichi(JP)
Inventor: Makino, Reiji
NAGOYA OILCHEMICAL COMPANY LIMITED
213-5 Honowari
Minamishibata-cho Tokai Aichi(JP)
Inventor: Iwata, Hisami
TOYOTA JIDOSHA KABUSHIKI KAISHA 1
Toyota-cho
Toyota Aichi(JP)

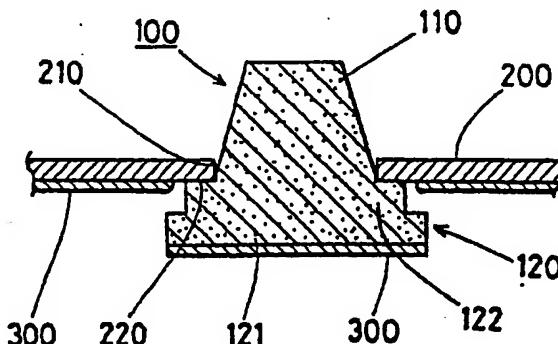
(74) Representative: Senior, Alan Murray et al
J.A. KEMP & CO 14 South Square Gray's Inn
London WC1R 6EU(GB)

(54) A masking member.

(57) A masking member (100) consisting of an inserting part (110) and a double flange (120) formed at the base of the inserting part (110) wherein the diameter of the outer part (121) of the double flange is larger than the diameter of the inner part (122) of the double flange. When the masking member (100) is used, the inserting part (110) of the masking member is inserted into a hole of an article and the double flange (120) of the masking member covers the surroundings of the hole. Thus the inside of the hole and the surroundings of the hole are protected from a surface treatment and the removing of the masking member after the surface treatment from the hole may be very smooth without obstruction of the film of the surface treatment since the film may be cut by the edge of the outer part of the double flange.

EP 0 257 872 A2

FIG. 2



A MASKING MEMBER

The present invention relates to a new masking member used to protect the inside and circumference of a hole such as a water outlet hole, a cable-piercing hole, and the like from a surface treatment such as coating, plating, phosphatizing, vacuum evaporation and the like. More particularly, the present invention relates to a masking member consisting of an inserting part and a double flange formed at the base of said inserting part wherein the diameter of the outer part of said double flange is larger than the diameter of the inner part of said double flange.

In a case where a surface treatment is effected on the surface of an article, said surface of said article often has one or more hole(s) whose inside must be protected from said surface treatment. The hole(s) may be a water outlet hole, a cable piercing hole, and the like, and a grommet, a plug, a bolt and the like may be inserted into said hole(s).

Hitherto, a masking member of the plug type has been used to protect said hole from a surface treatment. The masking member may be inserted into a hole of an article to be protected before said surface treatment, and when the surface treatment is effected on the surface of an article, the hole of said masking member is not subjected to the surface treatment. After the surface treatment, the masking member may be removed from the hole of said article. Nevertheless, the resulting film of the surface treatment covers continuously the surface of the article and the surface of said masking member enough to obstruct the smooth removing of the masking member from the hole of the article. Further, in a case where the surface treatment is a coating and the masking member has a taper form, the coating may collect on the surroundings of said hole, namely on the surroundings of the masking member to form a thick part of said coating film on said surroundings of said hole. This thick part may obstruct a grommet, plug, bolt and the like from fitting tightly to said hole.

Accordingly, an object of the present invention is to save trouble when the masking member is removed from such a hole in an article, the inside of which is necessary to be protected from a surface treatment.

Further, the object of the present invention is to provide a tight fitting for a grommet, plug, bolt and the like to said hole(s) of an article. According to the present invention, there is provided a masking member consisting of an inserting part and a flange characterised in that the flange is a double flange

formed at one end of said inserting part wherein the diameter of the flange of the double flange remote from the inserting part is larger than the diameter of the flange next to the inserting part.

Optional features of the member are defined in the sub-claims. When the masking member is used, the masking member is inserted into the hole of the article, the inside of which is necessary to be protected from a surface treatment, and the double flange of said masking member covers the surroundings of said hole and, as a result, the inside of said hole(s) is protected from a surface treatment and the film of the surface treatment is cut by the edge of the upper part of the double flange of the masking member.

The masking member may be removed from the hole of an article without obstruction of the film of said surface treatment and a grommet, plug, bolt and the like may fit tightly in the hole of the article.

The masking member may be made of plastics such as polystyrene, polyethylene, polypropylene and the like, or rubber such as styrene-butadiene rubber, acrylonitrile-butadiene rubber and the like, or a foam of such plastics or such rubber, and the masking member may be coloured by (a) suitable colour(s) if desired, for the purpose of selection of the specified masking member according to the hole into which it is to be inserted. A masking member made of polystyrene foam may be one of the most suitable masking members in the present invention.

The invention will be further described by way of non-limitative example with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of an embodiment of the present invention;

Figure 2 is a partial side sectional view of the article including a hole after the surface treatment;

Figure 3 is a partial perspective view of said article including said hole after the removal of said masking member; and

Figure 4 is a partial side sectional view of the article including said hole into which a grommet has been inserted.

Figures 1 to Figure 4 illustrate an embodiment of the present invention. Referring now to the figures, a masking member 100 consists of an inserting part 110 and a double flange 120 formed at the base of the inserting part 110 wherein the diameter of the outer part 121 of the double flange 120 is larger than the diameter of the inner part 122 of the double flange 120. The inserting part 110 has a taper form decreasing in diameter from the base of said

inserting part I10 to the top of said inserting part I10. The outer surface of the masking member conforms to a surface of revolution about its longitudinal axis.

When the masking member 100 is used, the masking member 100 protects the inside of a hole 210 of an article 200 by inserting the inserting part I10 into the hole 210 as shown in Fig. 2, and the inner part I10 of the double flange I20 of the masking member 100 covers the surroundings 220 of the hole 210. After this, a surface treatment such as a coating is effected on the surface of the article 200 to form a film 300 of the surface treatment and the inside and surroundings of the hole 210 are not subjected to the surface treatment and, further, the film 300 of the surface treatment may be cut by the edge of the outer part I21 of the double flange I20 of the masking member 100 on the surrounds 220 of the hole 210. After the surface treatment, the masking member may be removed from said hole 210 by hand, hook, and the like. In a case where the masking member 100 is made of a thermoplastic foam, the masking member 100 can be removed from the hole 210 by heating at a temperature higher than the softening point of the thermoplastic foam. When the masking member 100 made of the thermoplastic foam is heated to a temperature higher than the softening point of the thermoplastic foam of the masking member it may be softened and gases such as air, gas of a blowing agent, and the like in the cells of the thermoplastic foam may first expand and so the masking member may also expand and, then, when the gases leave the cells, said masking member 100 may shrink rapidly and remove itself naturally from the hole 210. As beforementioned, the masking member 100 may be smoothly removed without the obstruction of the film 300 of the surface treatment since the film 300 is cut by the edge of the outer part I21 of the double flange I20 of the masking member 100 on the surroundings 220 of the hole 210. After the masking member 100 is removed from the hole 210, said film 300 has not been formed inside and on the surroundings 220 of the hole 210 as shown in Fig. 3 and a grommet 400 may be tightly inserted into the hole 210 without looseness as shown in Fig. 4, since there is no thick part of the film 300 of said surface treatment on the area 220 surrounding the hole 210. Further, the masking member 100 can be used for many holes having different diameters since the Inserting part I10 of the masking member 100 has a taper form as before mentioned.

Claims

1. A masking member consisting of an inserting part (I10) and a flange (I20) characterised in that the flange (I20) is a double flange formed at one end of said inserting part (I10) wherein the diameter of the flange (I21) of the double flange remote from the inserting part (I10) is larger than the diameter of the flange (I22) next to the inserting part (I10).

2. A masking member according to claim 1 coloured by (a) suitable colour(s).

3. A masking member according to claim 1 or 2 made of a thermoplastic foam.

4. A masking member of claim 3, wherein said thermoplastic foam is a polystyrene foam.

5. A masking member according to any one of the preceding claims and whose surface conforms to a surface of revolution.

6. A masking member according to any one of the preceding claims wherein the inserting part (I10) tapers in diameter in the direction, longitudinally of the member, away from the double flange.

7. In a method comprising surface treatment of a workpiece having at least one hole requiring masking the steps of inserting, prior to surface treatment of the workpiece, in the or each such hole a masking member according to any one of the preceding claims and removing the member(s) after the surface treatment.

30

35

40

45

50

55

FIG. 1

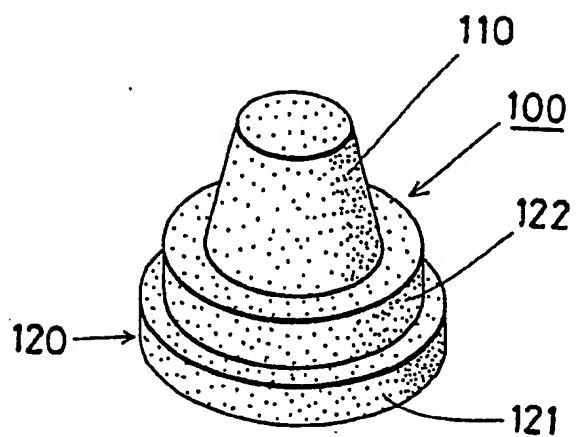


FIG. 2

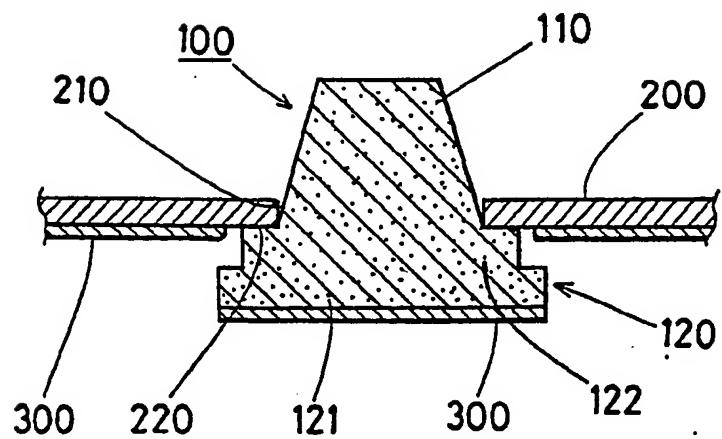


FIG. 3

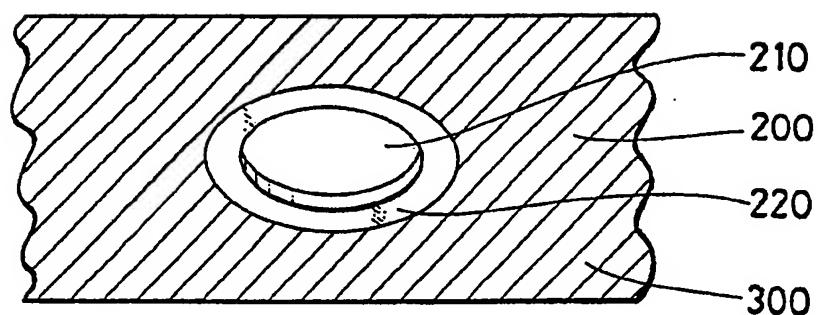


FIG. 4

